THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID C. WAUGH and RANDALL D. HAMPSHIRE

Appeal No. 1997-3923
Application 08/212,203

HEARD: March 9, 2000

Before JERRY SMITH, LALL and FRAHM, Administrative Patent Judges.

FRAHM, Administrative Patent Judge.

DECISION ON APPEAL

Appellants have appealed to the Board from the examiner's final rejection of claims 1 to 7, which constitute all of the pending claims in the application before us.

BACKGROUND

The subject matter on appeal is directed to an improved method for seeking tracks (i.e., computer files) on a disc surface by controlling the velocity and acceleration of a transducer from an initial track to a target track by adjusting actuator coil current (see Brief, pages 4 to 6; specification, pages 2 to 5). The acceleration of the transducer is related proportionately to the current passing through the actuator coil, so acceleration can be controlled by changing actuator coil current. As stated by appellants at page 3 of the specification, it is desirable to reduce the time it takes during the seek phase for the transducer to locate the target track by using correction signals which are based on a velocity profile. Because correction signals based on maximum acceleration and deceleration (needed to reduce seek time) using maximum current tend to cause overshooting of the target track as well as requiring settling time, it is conventional to base corrections on a nominal current that is a percentage of the maximum current (typically 80 to 90 percent) for the actuator coil (see specification, page 7). However, use of a lower, nominal current typically increases the time required to move the transducer during the seek phase (see specification, page 8).

Appellants have recognized that the use of correction signals based on variations of the maximum actuator coil current during acceleration and deceleration of the transducer substantially reduces seek time (see specification, page 8). More specifically, appellants provide a scale factor based on a ratio of maximum coil current to nominal coil current which increases the velocity over the

conventional profile velocity used to generate correction signals. Appellants base their calculation of the correction signal on a "demand velocity" which is equal to the velocity from the velocity profile increased by the scale factor. In this manner, "[t]he net result is that the seek phase will be carried out using the maximum current available under existing circumstances to accelerate and decelerate the transducers at a rate that will minimize the time for effecting the seek phase" (specification, page 10).

Representative independent claim 1 is reproduced below:

1. In a method for moving a transducer of a disc drive from an initial track on the surface of a disc to a target track on the disc surface, the method including a seek phase wherein the transducer is initially accelerated from the initial track and subsequently decelerated toward the target track in relation to electrical currents supplied by an actuator driver to an actuator whereon the transducer is mounted by adjusting the actuator current in each of a succession of time intervals in relation to a profile velocity determined in relation to the distance between the transducer and the target track, the improvement comprising the steps of:

for a seek having a length greater than a preselected minimum seek length, measuring the actuator current during acceleration of the transducer for at least one time interval selected to determine substantially the maximum current the actuator driver can supply to the actuator;

generating a scale factor from said measured actuator current and a preselected nominal actuator current, said scale factor increasing in a preselected relation to the ratio of the measured actuator current to the nominal actuator current; and

thereafter, in each of said time intervals, the steps of:

scaling the profile velocity with said scale factor to generate a demand velocity;

determining the velocity of the transducer with respect to the disc surface;

generating a correction signal from the difference between the demand velocity and the velocity of the transducer with respect to the disc surface; and

transmitting the correction signal to the actuator driver to control the current supplied to the actuator.

The following references are relied on by the examiner:

DuVall	4,355,273	Oct. 19, 1982
Lee	4,638,230	Jan. 20, 1987
Edel et al. (Edel)	4,835,633	May 30, 1989

Claims 1, 2, 5, and 6 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Edel in view of Lee.

Claims 3, 4, and 7 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Edel in view of Lee, further in view of DuVall.

Rather than repeat the positions of appellants and the examiner, reference is made to the Brief and the Answer for the respective details thereof.

OPINION

In reaching our conclusion on the issues raised in this appeal, we have carefully considered appellants' specification and claims, the applied patents, and the respective viewpoints of appellants and the examiner. As a consequence of our review, we are in general agreement with appellants (Brief, pages 8 to 19) that the claims on appeal would not have been obvious to one of ordinary skill in the art at the time the invention was made in light of the collective teachings of the applied prior art. We find that the examiner has failed to make out a prima facie case of obviousness. For the reasons which

follow, we will not sustain the decisions of the examiner rejecting claims 1 to 7 under 35 U.S.C. § 103.

At the outset, we note that representative claim 1 on appeal clearly requires controlling transducer movement to reduce seek time by determining "the maximum current the actuator driver can supply to the actuator," "generating a scale factor" based on the "measured actuator current" and a "nominal actuator current," and "scaling the profile velocity with said scale factor to generate a demand velocity" (see claim 1 on appeal). We further note that our careful review of the examiner's statement of the rejection in the final rejection (paper no. 12) and the examiner's response to appellants' arguments in the Answer, reveals that the examiner nowhere asserts that either Edel or Lee, either individually or in combination, teach or suggest generating a demand velocity as defined by appellants in claim 1 on appeal. The portion of the statement of the rejection (see final rejection, pages 2 to 3) describing the teachings and suggestions of Edel fails to state Edel teaches using or determining "maximum acceleration" as required by representative claim 1, and instead states that Edel uses an "average acceleration factor" calculated over a mid-band range of tracks (see Answer, page 3).

We find that the examiner has not satisfactorily shown that the collective teachings of Edel (especially columns 7 and 8 cited by the examiner) or Lee would have fairly taught or suggested at least the recited feature of determining "the maximum current the actuator driver can supply to the actuator,"

and thus has failed to make out a prima facie case of obviousness with respect to claim.

We agree with appellants' argument (see Brief, page 9) that one of ordinary skill in the art, having only the applied references to Edel and Lee before him/her, would not have found it obvious to determine a maximum actuator driver current, combine that maximum current with a nominal current to establish a scale factor, scale a profile velocity using the scale factor to find a demand velocity, and then output a resultant correction signal to the actuator driver. Thus, we cannot find that the invention recited in representative claim 1 would have been obvious to one of ordinary skill in the art. We also agree with appellants' assertion (see Brief, page 14) that Edel's quadratic equation involving an average acceleration factor ($[(K_f/M)_{MES}]/[(K_f/M)_{NOM}]$) fails to teach or suggest appellants' generation of a demand velocity which is based on a maximum current and represents a scaling of the profile velocity used to reduce seek time as claimed. We are in agreement with appellant that "[b]oth Edel ['633] and Lee ['230] are completely silent with regard to the maximum current that can be supplied by the actuator driver to the actuator coil" (Brief, page 17), and that "there is nothing in Edel ['633] or Lee ['230] to suggest measuring the maximum current the actuator driver can supply during a seek as required by claim 1" (Brief, page 18).

Because we find that the salient features (e.g., determining maximum current, employing a

scaling factor, finding a demand velocity) as discussed above are neither taught nor would have been suggested by Edel and Lee, we find that the examiner has failed to make a prima facie case that Edel in view of Lee would have taught or suggested the method of reducing target track seek time as defined in representative independent claim 1 on appeal.

With respect to independent claim 5, we cannot sustain the rejection of this claim for the same reasons discussed above with respect to representative claim 1, since claim 5 contains similar limitations.

With respect to dependent claims 2 and 6, we cannot sustian the rejections as to these claims for at least the same reasons discussed above with respect to independent claims 1 and 5 from which they depend.

With respect to dependent claims 3, 4, and 7, we find that while DuVall does teach using a square root of velocity in calculating correction signals for a magnetic disc transducer, DuVall fails to provide for the deficiencies of Edel and/or Lee with respect to the determination and use of a maximum actuator current, generating a scale factor based on the measured actuator current and a nominal actuator current, and scaling a profile velocity with the scale factor to generate a demand velocity as required by representative claim 1. Accordingly, we cannot sustain the rejection as to dependent claims 3, 4, and 7 for at least the same reasons discussed with respect to independent claims 1 and 5.

For the foregoing reasons, the rejections of claims 1 to 7 under 35 U.S.C. § 103 as being

unpatentable over the various combinations of Edel, Lee, and DuVall cannot be sustained.

CONCLUSION

The decision of the examiner rejecting claims 1, 2, 5, and 6 under 35 U.S.C. § 103 over Edel in view of Lee is reversed.

The decision of the examiner rejecting claims 3, 4, and 7 under 35 U.S.C. § 103 over Edel in view of Lee and DuVall is reversed.

REVERSED

JERRY SMITH Administrative Patent Judge	))))) BOARD OF PATENT
PARSHOTAM S. LALL Administrative Patent Judge	)) APPEALS AND)) INTERFERENCES)

ERIC FRAHM)
Administrative Patent Judge)

EF/pgg
Randall K. McCarthy
Crowe & Dunlevy
1800 Mid-America Tower
20 N. Broadway
Oklahoma City, OK 73102-8273